

## CLAIMS

- 1 1. A sensor system with variable sensor-signal processing, comprising:
- 2 a sensor unit and an analytical unit;
- 3 - the sensor unit comprises a sensor element to detect a measurement variable (M) and to
- 4 generate a sensor signal (U(M)) to represent the measurement variable (M), and a sensor-signal
- 5 processing unit to process a sensor signal (U(M)), which represents the measurement variable
- 6 (M), in accordance with prescribed parameters ( $c_1, c_2, c_3 \dots c_m, c_{m+1} \dots c_M$ ), such that the parameters
- 7 ( $c_1, c_2, c_3 \dots c_m, c_{m+1} \dots c_M$ ) for processing the sensor signal can be adjusted externally;
- 8 - the sensor element has at least one input to which the measurement variable (M) can be
- 9 conducted, and at least one output, from which the sensor signal (U(M)), representing the
- 10 measurement variable (M), can be tapped;
- 11 - the sensor-signal processing unit has at least one input and at least one output ( $A; A_1,$
- 12  $A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ );
- 13 - at least one input of the sensor-signal processing unit is connected to at least one output
- 14 of the sensor element;
- 15 - at least one output (A) of the sensor-signal processing unit is assigned to output the
- 16 sensor signal (Out), which has been processed in the sensor-signal processing unit;
- 17 - at least one output ( $A, A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ ) of the sensor-
- 18 signal processing unit is connected to the analytical unit, through a corresponding connecting
- 19 line ( $A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ );
- 20 - the analytical unit functions to analyze output signals (Out) which are transmitted from

21 the sensor-signal processing unit, wherein

22 - the analytical unit further functions to redefine at least one parameter ( $c_1, c_2, c_3, c_m,$

23  $c_{m+1} \dots c_M; A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ ) for signal processing, on the basis

24 of output signals (Out) delivered by the sensor-signal processing unit;

25 - there is at least one connecting line or a wireless connection path between the sensor-

26 signal processing unit and the analytical unit, to transmit at least one of the newly defined

27 parameters ( $c_1, c_2, c_3, c_m, c_{m+1} \dots c_M; A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ ) to the

28 sensor-signal processing unit, to modify the processing of the sensor signals

29 - the sensor-signal processing unit functions to set the transmitted parameters ( $c_1, c_2, c_3, c_m,$

30  $c_{m+1} \dots c_M; A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ ).

2. The sensor system of claim 1, characterized in that a connecting line for transmitting the redefined parameters ( $c_1, c_2, c_3 \dots c_m, c_{m+1} \dots c_M; A_1, A_2 \dots A_k, A_{k+1} \dots A_K; D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ ) is that connecting line (A) which is connected to the output (A) which outputs the processed sensor signal.

3. The sensor system of claim 2, characterized in that a connecting line which transmits the determined parameters is a common power supply line (V) for the sensor unit and the analytical unit.

4. The sensor system of claim 3, characterized in that a necessary change of a parameter ( $c_1, c_2, c_3 \dots c_m \dots c_M$ ) for signal processing can be determined during running operation, and that at least one of the newly determined parameters ( $c_1, c_2, c_3 \dots c_m \dots c_M$ ) can be transmitted during running operation.

1 5. The sensor system of claim 4, characterized in that a filtering device is present, which  
2 allows the determined parameters ( $c_1, c_2, c_3 \dots c_m \dots c_M$ ) to be transmitted only if this will not  
3 disturb signal transmission from the sensor unit.

1 6. The sensor system of claim 5, characterized in that at least one parameter ( $c_1, c_2, c_3 \dots c_m \dots c_M$ )  
2 can be transmitted by the change of an output load ( $I_{load}$ ) between the sensor-signal processing unit  
3 and the analytical unit.

1 7. The sensor system of claim 6, characterized in that the output load ( $I_{load}$ ) is continuously  
2 variable.

1 8. The sensor system of claim 7, characterized in that the output load ( $I_{load}$ ) is stepwise variable.

1 9. The sensor system of claim 8, characterized in that at least on parameter ( $c_1, c_2, c_3 \dots c_m \dots c_M$ )  
2 can be transmitted by changing a supply voltage ( $U_s$ ) for the sensor unit.

1 10. A method for changing the signal processing in a sensor system, with the following  
2 features:

3 - a measurement variable ( $M$ ) is detected in a sensor element, which is part of a sensor unit,  
4 and a sensor signal ( $U(M)$ ) is generated, which represents the measurement variable ( $M$ );

5 - the sensor signal ( $U(M)$ ) is processed in a sensor-signal processing unit, which likewise is  
6 part of the sensor unit, in accordance with prescribed parameters ( $c_1, c_2, c_3 \dots c_m \dots c_M$ ), such that  
7 the parameters ( $c_1, c_2, c_3 \dots c_m \dots c_M$ ) can be adjusted externally;

8 - at least one signal ( $Out$ ) processed in the sensor processing unit is analyzed in an  
9 analytical unit;

10 characterized in that